QUEEN MARY, UNIVERSITY OF LONDON

MTH 4106 Introduction to Statistics

Assignment 9 For handing in on 20–21 March 2012

You should attempt all of these questions, as they are designed to help you to learn and understand the material in the course.

The 'Feedback' question is the one for handing in. Write your name, student number and group number at the top of your answer before handing it in. Staple all the pages together. Either (i) hand it to your allocated tutor when (s)he asks for it during your allocated Minitab laboratory session on Tuesday 20 March 2012, or (ii) post it in the red post-box on the ground floor of the Maths building before 1400 on Wednesday 21 March 2012.

If you want help on any of the other questions, or want to check that you have done them correctly, you may ask any tutor during your laboratory session or ask me in any of my office hours.

1 A charter aeroplane company is asked to carry regular loads of 100 sheep. The plane available for this work has a carrying capacity of 5000 kg. A sample of 1000 sheep which are typical of those that might be carried shows that the distribution of sheep weight has a mean of 48 kg and a standard deviation of 3 kg.

Consider the population of all possible loads of 100 sheep. Let T be the weight of a randomly chosen such load.

(a) Estimate $\mathbb{E}(T)$ and $\mathrm{Var}(T)$.

(b) Find the probability that a randomly chosen load will be too heavy for the plane.

2 From a population of about 70,000 female students at a certain university in the U.S.A., twenty were chosen at random. Their heights were recorded to the nearest inch, as shown in the following table.

height (inches)	62	63	64	65	66	67	68	69
frequency	1	1	2	5	4	4	2	1

Estimate the mean height of female students at this university. Give the estimated standard error of your estimate.

3 (Feedback) Write a report on Part 5 of Practical 9. Your report should include

(a) your chosen distribution, its mean and variance;

(b) the first graph;

(c) an account of what you did to construct the first graph;

(d) comments on what this graph shows, and whether or not this agrees with what theory predicts;

(e) the second graph;

(f) an account of what you did to construct the second graph;

(g) comments on what this graph shows, and whether or not this agrees with what theory predicts.